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THE RELATIONSHIP BETWEEN ADHD AND EMOTION REGULATION AND ITS EFFECT ON PARENTING STRESS

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May 2017

THE RELATIONSHIP BETWEEN ADHD AND EMOTION REGULATION AND ITS EFFECT ON PARENTING STRESS

By Cibrian Johnson

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ABSTRACT

THE RELATIONSHIP BETWEEN ADHD AND EMOTION REGULATION AND ITS EFFECT ON PARENTING STRESS

Cibrian Johnson

May 2017

This study examined the relationship between ADHD diagnostic status and child-reported emotion regulation and its relationship with parenting stress within three subscales – Parent Distress, Difficult Child, and Parent-Child Dysfunctional interaction. Two hundred children ages 7-13 were enrolled in the study, including 120 children with ADHD and 80 children without ADHD. Overall, it was found that ADHD diagnostic status was significantly associated with the Parent Distress subscale, both ADHD diagnostic status and emotion regulation difficulties were significantly associated with the Difficult Child subscale, and emotion regulation difficulties were significantly associated with the Parent-Child Dysfunctional interaction subscale. This study not only shows that there should be an emphasis on treating parenting stress, but the differences between subscales shows that the type of parenting stress discussed matters when implementing treatment as well.

Parenting Stress

The amount of parenting stress experienced fluctuates within each home, and many factors can come into play when assessing which parents experience more stress in comparison to others. Parenting stress is a distinct type of stress that arises when a parent's perceptions of their parenting demands outstrip his or her resources for dealing with them (Theule, Wiener, Tannock & Jenkins, 2012). There are different types of parenting stress, or groups of factors that contribute to the manifestation of parenting stress. This includes parenting stress that arises from parental difficulties, parenting stress that arises from child behaviors, and a combination of the two that interact within the parent-child relationship. More so than other types of stress, parenting stress is associated with parenting practices and child development (Theule et. al, 2012) In efforts to find causal mechanisms for parenting stress and to understand its stability over time, Williford, Calkins, & Keane, (2006) measured mothers and their children - ages 2, 4 and 5. The predictors of 2 year parenting stress were: single parenthood, maternal psychopathology, child anger proneness, and child emotion dysregulation. Child externalizing behaviors predicted initial status and changes across time. Stability of parenting stress was dependent on child externalizing behaviors. In another research study, parenting stress was also linked to higher levels of child behavior problems. Parents perceive those behavior problems as stressful, which is then associated with more negative parenting practices. (Heath, Curtis, Fan & McPherson, 2015. These negative parenting practices consist of less warmth and engagement

when engaged in problem solving and greater use of an authoritarian parenting style. Difficulties handling behavior problems have also been linked with parent challenges with treatment.

ADHD

Attention-deficit hyperactivity disorder (ADHD) is the most frequently diagnosed neurodevelopment disorder (Aguiar, Eubig & Schantz, 2010). It is a condition characterized by inattention, impulsivity, and hyperactivity (Theule, Wiener, Tannock, & Jenkins 2012). It is also characterized by 3 subtypes: inattentive, hyperactive/impulsive, and combined. Symptoms typically experienced are forgetfulness, problems paying attention, blurting out answers before a question is completed, acting as if "driven by a motor," impulsive behavior, and talking excessively. Family studies have consistently backed up the notion that ADHD is highly familial, showing that up to two-thirds of children with ADHD have a parent with a history of ADHD (Theule et al. 2011). Factors that have been shown to increase the risk for ADHD are pregnancy and delivery complications, low birth weight, low socioeconomic status, and exposure to substances such as lead, cigarette smoke, and alcohol (Banerjee, Middleton, & Faraone, 2007). Comorbid disorders linked to ADHD are mood and anxiety disorders, oppositional defiant disorder and learning disorders (Pliszka, 1998). Significant child-level predictors of parenting stress in families of children with ADHD include the overall severity of child ADHD symptoms (Theule, Wiener, Tannock, Jenkins, 2011).

Having a child with ADHD has been shown to significantly increase the amount of stress experienced by parents. Studies have shown that parents of children with ADHD experience more parenting stress than parents of children without any clinical disorders (Theule et al.,

2012). This could be attributed to parents having to provide extra supervision and care at home, while managing more parental demands outside of the home, as children with ADHD experience frequent academic, behavioral, and social problems at school (Walerius et al., 2016). This is important because parenting stress plays a pivotal role in treatment for these children. The more parenting stress experienced, the less able the parent could be in providing effective resources for treatment – whether it is seeking treatment or being involved in treatment for the child. As a result of the child not receiving treatment, the child could fall further behind academically, behaviorally, and socially. Also, while parental involvement in treatment is necessary for achieving positive mental health outcomes for the child, the process of encouraging parents to attend and actively participate in services for their children may present additional strains for the caregiver (Bode, George, Weist, Stephan, Lever, Youngstrom, 2016).

Emotion Regulation

Experiencing a range of positive and negative emotions is needed for human survival. With that being said, it is not negative emotions but the inability to regulate emotions in general that can lead to mental health conditions (Cracco, Durme, & Braet, 2015). Emotion regulation can be defined as goal directed processes functioning to influence the intensity, duration, and type of emotion experienced (Gyurak, Gross, & Etkin 2011). Maladaptive emotion regulation has been linked to depressive symptoms, anxiety symptoms, eating disorder symptoms and behavioral problems (Cracco, Durme, & Braet, 2015). Emotion regulation difficulties in children are also linked to social problems (Rosen, Milich, & Harris, 2012). Difficulties with regulating anger, specifically, are related to aggression. This is partly because some individuals, when

experiencing anger, use aggression to regulate the anger. Aggression may be a particularly impairing outcome of ADHD and of emotion dysregulation. Discipline problems, school expulsion, and social rejection are likely outcomes for aggressive youth (Bunford, Evans, & Wymbs, 2015). This insight provides evidence to the idea that ADHD co-occurring with emotion dysregulation has been linked to greater impairment in children (Theule et al. 2012).

Furthermore, these difficulties can also lead to increased parenting stress. Parents may have a hard time dealing with the challenges that come with caring for a child that has difficulties maintaining a normally fluctuating emotional state. Although having some parenting stress is considered normal, parents who experience extreme levels of this stress may suffer psychologically and again, may be less able to implement interventions to help their children (Theule et al., 2011). While finding resources to help the child adopt coping mechanisms is important, the parent-child relationship may become strained as the parents' stressors increase. This could lead to a cycle of psychological harm to the parent and child if both do not seek support.

ADHD x Emotion Regulation

Besides aggression being an impairing outcome of ADHD and emotional dysregulation, there are other ways in which symptoms of ADHD and emotion regulation interact. Emotion regulation has been shown to be an underlying mechanism to the positive relationship between ADHD and depression (Seymour, Chronis-Tuscano, Iwamoto, Kurdziel & MacPherson, 2014). This could be a result of the child not being able to properly handle the frustration that could occur from negative feedback linked to ADHD symptomology. Many children with ADHD get reprimanded

for behaviors that are harder for them to control. They also deal with social rejection from peers. There is also a connection between emotion regulation difficulties and effortful control, which is the deliberate modulation of emotional states and subsequent behaviors – implicit in symptoms of ADHD (Seymour et al.). Youth with ADHD who demonstrate emotion regulation deficits have been shown to have a harder time dealing with frustration when completing tasks and are less likely to seek help. They have been shown to exhibit extreme levels of negative affect and poorer problem-solving abilities, and focus more on the negative aspects of a task compared to healthy controls. (Seymour et al.)

A child's ADHD symptomology could be heightened by the presence of emotion regulation difficulties, which would create more issues for them than children with just ADHD alone. This could present problems in a range of settings that could contribute to increased parenting stress within each type. In regards to parenting stress that arises from parental difficulties, parental psychopathology including ADHD and depressive symptomology have been shown to be predictors to parenting stress (Theule et al., 2011). In regards to parenting stress that arises from child behaviors, internalizing and externalizing, the depressive symptoms, aggression, emotion impulsivity, extreme levels of negative affect, and poorer problem solving abilities would work to exacerbate parenting stress. When ADHD symptoms and emotion regulation difficulties interact they could make the child even more dependent on the parent, and more likely to misbehave in a classroom or be socially rejected by peers.

Research Questions

Having a better understanding of the relationship between ADHD and emotion regulation will give us better insight on whether and to what extent symptoms become amplified with regards to parenting stress when both interact. Having a better understanding could lead to more effective treatment for these children who are not recognized as extensively in research as children are with just ADHD or just emotion regulation difficulties. It has been shown in prior research that parents of children with ADHD experience more parenting stress, but the goal is to see if parenting stress will further increase when emotion regulation difficulties are factored in. It is also to see if there are certain types of parenting stress that are more likely to become exacerbated by ADHD vs. emotion regulation difficulties. Knowing the relationship between ADHD, emotion regulation difficulties and its impact on parenting stress will be important for future implications, regarding support for parents that will ultimately enhance the treatment for children living with ADHD and emotion regulation difficulties.

With this study, the first aim is to look at the relationship between ADHD status and each subscale of parenting stress (i.e., parent distress, difficult child, parent-child difficult interaction.) It is hypothesized that parents of children with ADHD will experience a significantly larger amount of parenting stress than parents of children without ADHD. The second aim is to look at the relationship between parents of children with emotion regulation difficulties and parents of children without emotion regulation difficulties. It is hypothesized that parents of children with greater emotion regulation difficulties will experience a significantly larger amount of parenting stress than parents of children with fewer emotion regulation difficulties regardless of ADHD. The third aim is to examine how ADHD and emotion regulation interact in relation to parenting stress. An interaction effect will be examined between these factors to see if parents of children

with ADHD and emotion regulation difficulties experience more parenting stress than parents of children with just ADHD.

Methods

Participants. Two hundred children ages 7-13 (*M* age = 9.26; *SD* = 1.46) were enrolled in the current study. Participants in this study included 120 children with ADHD (78 boys, 42 girls; *M* age = 8.99; *SD* = 1.39) and 80 children without ADHD (46 boys, 34 girls; M age = 9.66; SD = 1.48). All participants for this study were recruited through advertisements distributed through elementary schools in a mid-sized Midwestern metropolitan area. The Diagnostic Structured Interview for Children (DISC; Shaffer, Fisher, Lucas, Dulcan, & Schwab-Stone, 2000) was used to assess for ADHD diagnostic status. Children without ADHD represented a community sample. Therefore, this study did not exclude children who showed symptoms, but did not meet criteria for ADHD. Also, children were not excluded from the non-ADHD sample if they showed symptoms, or met criteria for any internalizing and externalizing disorders other than ADHD. The ethnic composition of the sample was representative of the area in which the data was collected. Within the study 64.5% identified as Caucasian/White, 23.5% identified as African American/Black, 4.0% identified as Latino/Hispanic, 7.0% identified as Biracial, and 2% identified within the Other category.

Procedures. Parents and children provided informed consent and assent to study procedures. After providing informed consent and assent, parents completed the DISC-P, a diagnostic structured interview designed to assess for the presence of ADHD. Additionally, parents completed the Parenting Stress Inventory, a well-established measure to assess for parenting

stress. Children completed the Emotion Regulation Index for Children and Adolescents, a well-established measure assessing emotion regulation difficulties. Parents and children were compensated for study participation. This study was IRB approved.

Measures

The Diagnostic Interview Schedule for Children (DISC-P; Shaffer et al., 2000). The DISC-P is a structured diagnostic clinical interview. This interview assesses for the presence of child psychiatric diagnoses according to Diagnostic and Statistical Manual of Mental Disorders (4th ed.; DSM-IV; APA, 1994) criteria. The DISC-P was used to determine child ADHD diagnostic status. Research supports the validity and reliability of the DISC-P to diagnose ADHD across numerous settings (Shaffer et al., 2000).

Emotion Regulation Index for Children and Adolescents (ERICA; MacDermott, Gullone, Allen, King, & Tonge, 2010). The ERICA is a self-report adaptation of the Emotion Regulation Checklist designed to assess children's perceptions of their ability to regulate and manage their emotions. The ERICA is a 16-item self-report inventory that asks children to rate their emotion regulation on a 5-point Likert scale ("Strongly Disagree" to "Strongly Agree") and yields a general emotion regulation difficulties score. The ERICA has been extensively validated with children in the age range of the proposed study (MacDermott et al., 2010).

Parenting Stress Index- Short form. (PSI; Abdin, 1995). The PSI is a 36 item parent-report measure that assesses for parental stress that arises from the parent-child relationship, the parent characteristics, child characteristics, and parent-child interactions. This PSI asks parents to rate their stress on a 5point Likert scale (strongly agree to strongly disagree.) The PSI has

three empirically-derived factors measuring parenting behaviors named Difficult Child, Parental Distress, and Parent-Child Dysfunctional Interaction, as well as an overall parenting stress composite. An example of the type of statement found in the Parental distress subscale is, "I find myself giving up more of my life to meet my children's needs than I ever expected." This example represents the type of sentiments arising from the parent's role as a parent that could lead to stress. An example of the type of statement found in the Difficult Child subscale is, "Sometimes I feel my child doesn't like me and doesn't want to be close to me." which represents the negative sentiments arising from the interaction between the parent and child that could lead to parenting stress. Finally, an example of the Parent-Child Dysfunctional Interaction subscale is, "I feel that my child is very moody and easily upset," which represents the sentiments arising from difficult child characteristics that can lead to parenting stress. (PSI; Abdin, 1995).

Results

Bivariate Analyses. Initial bivariate analyses were conducted to assess the relation of ADHD and parenting stress subscales: Parental Distress, Difficult Child, Parent-Child Dysfunctional Interaction. A significant point-biserial correlation was observed between ADHD diagnostic status and the parent-reported Parental Distress ($r[184]= .22$, $p < .01$.), which shows that parents of children with ADHD reported more parent distress than parents of children without ADHD. A significant point-biserial correlation was observed between ADHD diagnostic status and the parent-reported Difficult Child subscale ($r[179]= .37$, $p < .01$.), which shows that parents of children with ADHD reported more parenting stress arising from difficult child characteristics

than children without ADHD. A significant point-biserial correlation was observed between ADHD diagnostic status and the parent-reported Parent-Child Dysfunctional Interaction subscale, (r[187]= .14, p <.05.), which shows that parents of children with ADHD reported more parenting stress arising from the difficult interactions experienced between the parent and child. A significant point-biserial correlation was observed between ADHD diagnostic status and child-reported emotion regulation (r[182]= .16, p =.04, which shows that children with ADHD report more emotion regulation difficulties.

Significant positive Pearson correlations were also observed between child-reported, ERICA-derived emotion regulation and the parent-reported parenting stress subscales. Specifically, a significant Pearson correlation was observed between emotion regulation and the Difficult Child subscale (r[167]=.17, p=.03), which shows that children who reported more emotion regulation difficulties had parents who reported more parenting stress arising from difficult child characteristics. A significant Pearson correlation was also observed between emotion regulation and the Parent-Child Dysfunctional interaction subscale (r[174]=.21, p<.01), which shows that children who reported more emotion regulation difficulties had parents who reported more parenting stress arising from difficult interactions with their child. However, there was not a correlation between child-reported emotion regulation and the Parent Distress subscale of parenting stress (r[171] = .07, p=.34), which shows that there was no significant relationship between children who reported more emotion regulation difficulties and parents who reported more parenting distress.

Multivariate Analyses. Three multivariate hierarchical linear regression analyses were conducted to examine the effect of ADHD diagnostic status and child-reported emotion

regulation (ERICA) on parent report of the three PSI dimensions (Parental distress, Difficult Child, Parent-Child Difficult Interaction). Both ADHD diagnostic status and child-reported emotion regulation were regressed on each parenting dimension of the PSI. Age, sex, and SES were entered into the first step to control for factors that are known to be associated with differing rates of parenting stress. ADHD diagnostic status and ERICA total score were entered into the second step. An ADHD by ERICA total score mean interaction was entered in the third step to whether ADHD moderated the effect of emotion regulation in the estimation of parenting stress dimensions.

Relation of child-report emotion regulation and ADHD diagnostic status to parent-report of PSI-parent distress. Results supported the hypothesis that parents of children with ADHD would experience greater parent distress than parents of children without ADHD. Results did not support the hypothesis that parents of children with greater emotion regulation difficulties would experience greater parenting distress than parents of children with fewer emotion regulation difficulties regardless of ADHD. Additionally, results also did not support the hypothesis that parents of children with ADHD and greater emotion regulation difficulties would experience greater parenting stress than parents of children with ADHD alone. Examination of the covariates entered into the first step of the model suggested that they contributed significantly to the model estimating parent distress, $F(3, 156) = 2.79$, $p=.04$, $R^2 = 0.05$. At this step, gender significantly estimated parent distress, ($\beta= .19$, $p= .02$), which showed that boys significantly estimated more parenting distress. Adding ADHD diagnostic status and ERICA-total score in the second step of the model explained an additional 5.4% of variation in parent distress, $F(5, 154) =3.6$, $p=.004$, $R^2 = 0.11$. At this step, ADHD diagnostic status ($\beta = .23$, $p = .004$) significantly

estimated parent distress, which shows that children with ADHD had parents who reported more parent distress. ERICA total score was not a significant estimator (β = .06, p =.45). Adding the interaction of ADHD diagnostic status and ERICA total score into the model only explained an additional 0.2% of variation in parent distress, $F(6, 153)= 3.06$, p =.007, R^2 = 0.11. The interaction term did not significantly contribute to the model estimating parenting distress (β = .06, p = .52).

Relation of child-report emotion regulation and ADHD diagnostic status to parent-report of PSI-difficult child. Results supported the hypothesis that parents of children with ADHD would experience greater parenting stress arising from the Difficult Child subscale, or child characteristics. Results also supported the hypothesis that parents of children with greater emotion regulation difficulties would experience more parenting stress due to difficult child characteristics than parents of children with fewer emotion regulation difficulties regardless of ADHD status. However, results did not support the hypothesis that parents of children with ADHD and greater emotion regulation difficulties would experience more parenting stress than parents of children with ADHD alone. Examination of covariates entered into the first step suggested that SES, gender, and age did not significantly estimate parent-reported parenting stress arising from the Difficult Child subscale, $F(3, 153)= .03$, p=.99, R^2 =.001. Adding ADHD diagnostic status and ERICA-total score into the second step of the model explained 19% of variation in difficult child parenting stress $F(5, 151) = 6.88$, p<.001, R^2=.186. At this step, ADHD status (β=.40, p<.001), and ERICA total score (β=.17, p=.031) were both significant estimators in the model predicting PSI-difficult child dimension, which shows that children with ADHD and children with more emotion regulation difficulties both significantly and

independently had parents who reported more parenting stress arising from difficult child characteristics. Adding the interaction of ADHD diagnostic status and ERICA total score into the model at step 3 only explained an additional 0.6% of variation in parent distress, $F(6, 150)= 5.92$, $p < .001$, $R^2 = .19$. The interaction term ($\beta = .098$, $p = .30$) was not a significant estimator in the model at step 3.

Relation of child-report emotion regulation and ADHD diagnostic status to parent-report of PSI-parent child dysfunctional interaction. Results supported the hypothesis that parents of children with emotion regulation difficulties had greater parenting stress resulting from difficult parent child-interactions than parents of children with fewer emotion regulation difficulties regardless of ADHD status. Results did not support the hypothesis that parents of children with ADHD would experience greater parenting stress than parents of children without ADHD. Additionally results did not support the hypothesis that parents of children with ADHD and emotion regulation difficulties would experience parenting stress more so than parents of children with ADHD alone. Examination of covariates entered at the first step suggested that gender, SES, and age did not significantly estimate parenting stress arising from parent and child difficult interactions $F(3, 159)=1.83$, $p = .14$, $R^2 = .03$. Adding ADHD diagnostic status and ERICA-total score into the second model explained an additional 4.4% of variance in parenting stress arising from the Parent-Child Dysfunctional Interaction subscale $F(5, 157)= 2.63$, $p = .026$, $R^2 = .077$. At this step, ERICA total score significantly estimated parenting stress arising from the Parent-Child Dysfunctional Interaction subscale ($\beta = .176$, $p = .032$), which shows that children with more emotion regulation difficulties had parents who reported more parenting stress arising from dysfunctional parent-child interactions. ADHD diagnostic status did not significantly

estimate parenting stress (β = .124, p =.126). Adding the interaction of ADHD diagnostic status and ERICA total score into the model at step 3 explained an additional 0.2% of variation in the Parent-Child Dysfunctional Interaction subscale, $F(6, 156)= 2.243$, p =.042, R^2 = .079. The ADHD diagnostic status and ERICA total score interaction effect was not significant (β=.06, p=.55).

Discussion

These findings give further insight into the relationship between ADHD diagnostic status, emotion regulation, and its effects on parenting stress. These results look at these relationships more extensively due to our examination of parent distress, difficult child characteristics, and the parent-child dysfunctional interaction within parenting stress. A significant strength of this study was our ability to extract information from both parents and children, in regards to the parent reports of parenting stress and child report of emotion regulation difficulties. These combinations work together to strengthen the findings. These results clarify the relations of ADHD and emotion regulation to parenting stress, and offer the opportunity to refine and improve treatment approaches for children with ADHD.

Findings and Theoretical Implications

In regards to the first hypothesis, these results coincide with previous findings that demonstrate ADHD diagnostic status as a significant estimator of some forms of parenting stress – more so than non-clinical controls (Theule, 2013). The findings also show that gender is a significant estimator as well, which are also consistent with previous findings that tend to show lower stress levels in samples with a higher proportion of girls (Theule, 2013). Results suggested

that ADHD diagnostic status was significantly linked to greater parent distress and parent-ratings of child difficulty, but was not independently related to parent-child interaction difficulties. By contrast, child reported emotion regulation difficulties were independently and significantly associated with greater child difficulty and parent-child interaction difficulties, but were not related to parent distress.

Since ADHD is a neurodevelopmental disorder, it can cause impairments in many areas of a child's life. ADHD in children has been shown to be associated with low academic achievement, poor school performance, retention in grade, school suspensions and expulsions, poor peer and family relations, anxiety and depression, aggression, conduct problems and delinquency (Barkley, 1997). In relation to this finding from prior research, it makes sense for parents of children with ADHD to feel weighed down by the responsibilities of being a parent or to feel incompetent if they feel as though they cannot handle the daily complications that happen as a result of the child's ADHD symptomology. Children with ADHD have also been shown to exhibit poor executive functioning, in a phenomenon called behavioral inhibition. Behavioral inhibition refers to three inhibitory functions – the ability to inhibit prepotent responses, to stop ongoing responses, and interference control. These inhibitory functions set the occasion for four executive functions – working memory, self-regulation of affect, internalization of speech, and reconstitution, to produce direct and causal effects on motor control (Barkley, 1997). Children with ADHD who lack behavioral inhibition have issues with hyperactivity and impulsivity – behaviorally and emotionally, that creates room for the academic problems and behavioral problems leading to suspension and expulsions as earlier discussed, as well as the internalizing

problems such as anxiety and depression. These problems could be the issues that the parents had in mind when reporting higher rates of child difficulty.

Also, children with ADHD are more likely to have comorbid disorders. According to Larson, Russ, Kahn & Halfon (2007), most children with ADHD had at least 1 comorbid disorder: 33% had 1, 16% had 2, and 18% had 3 or more when looking at bivariate and multivariable cross-sectional analyses conducted on data from the 2007 National Survey of Children's Health on 61779 children ages 6 to 17 years, including 5028 with ADHD. When symptoms of comorbid disorders interact with ADHD symptoms it can create an increased amount of impairment in the child's daily life. This in turn could also lead to an increased amount of parental distress and child difficulty.

In regards to the second hypothesis, these findings backed up previous research in that child emotion regulation difficulties significantly contributed to greater parenting stress within the difficult child and the parent-child dysfunctional interaction subscales. However, these findings did not support previous findings when looking at the parent distress subscale of parenting stress because it was not a significant estimator. The PSI-parent distress subscale pertains to the parent's difficulties as a parent – lack of social support, resources, and low sense of competence *(PSI;* Abdin, 1995). It is plausible that children with emotion regulation difficulties contribute more so to the difficult child subscale because of the way the parent interprets their behavior. Research has shown that children with negative emotional lability, a maladaptive form of emotion dysregulation, tend to be more irritable, hot-tempered, emotionally excitable, and unpredictable (Walerius et. al., 2016). These children have more difficulty

controlling negative and positive emotions, and are highly reactive when faced with situations that would be easier to handle for healthier controls. Parents could feel as though they cannot manage their behavior, and as a result experience more stress because of it. Parents may also feel increased levels of parenting stress within the parent-child dysfunctional subscale due to the lack of satisfying interactions they experience as result of the high sensitivity that these children have in response to certain situations.

In regards to the third hypothesis, our results showed that out of each subscale of the PSI, none of the interaction effects between ADHD diagnostic status and child reported emotion regulation contributed significantly to parenting stress. These results fell amongst mixed prior research findings where the interaction of ADHD and emotion regulation significantly contributed to parenting stress. In a study by Graziano, P. A. (2011), parents reported children's self-regulation across emotional, behavioral and cognitive domains to be stressful, and not simply the severity of ADHD symptoms. This implies that emotion regulation and ADHD contribute to parenting stress, but does not conclude that they work together to create even more parenting stress together vs. individually. This study goes deeper to pinpoint how much stress is being accounted for by both ADHD and emotion regulation within *PSI*- parent distress, difficult child, and parent-child dysfunctional interaction.

Clinical Implications

The results from this study indicate the need for more emphasis on treatment for parents of children with ADHD and emotion regulation difficulties. Existing treatment for impairing, externalizing behaviors in children with ADHD mainly consist of prescription stimulant

medication as well as parent or teacher administered behavior therapy (AAP, 2011). This kind of treatment is limited to care for the child. While there are parenting groups geared towards the improvement of the parent-child interaction, there are not many forms of treatment targeted specifically towards parents of children with ADHD, particularly regarding parental distress stress among the parents that report higher ratings of difficult child behavior. Strategies should be implemented to adapt a version of therapy for parents of children with ADHD. This is an important distinction due to the specific types of behaviors and emotions children with ADHD experience, and the specific types of stress that it causes for parents.

In regards to emotion regulation, specifically for the parents experiencing the parent-child dysfunctional interaction category of parenting stress, strategies should be implemented to adapt a version of parent-child interaction therapy for parents of children with impairing emotion regulation difficulties. This is an important distinction due to the specific types of behaviors and emotions children with emotion regulation difficulties exhibit, and the specific types of stress that it causes for parents. Strategies implemented should work towards changing externalizing behaviors associated with the inability to regulate negative emotions. In therapy for parents of children with emotion regulation difficulties, parents should be taught how to better cope with and manage their children's emotional reactions. Especially for the parents that struggle with emotional regulation difficulties themselves, they should be taught these coping mechanisms in order to model it for their children to further enhance the interaction between them.

Limitations

This study is representative of a community sample, specifically in a mid-sized Midwestern metropolitan area, but presented limitations. Firstly, the sample was a community based, largely Caucasian sample. While it targets a specific community, there is also a need for future studies to target larger, more diverse samples of children. It is plausible that the effectiveness of treatment for parenting stress could vary based on culture, or at the least the execution of the treatment. Also, the ERICA was used to assess emotion regulation, which means that it was child-reported. Research suggests that children with ADHD tend to have positive illusory bias, which refers to the overestimation of their emotional competence (Owens et al., 2007). Future studies could include parent and child reported measures to assess emotion regulation to account for both, and to also see the differences in results between the two. Another limitation presented was the use of DISC. While this measure validly assesses the presence of child psychiatric diagnoses according to Diagnostic and Statistical Manual of Mental Disorders (4th ed.; DSM-IV; APA, 1994) criteria, future studies would benefit from multi informant measures. This would include teacher-reported measures. Also, parents gave a retrospective report of stress, when filling out the PSI. Future studies could benefit from using Ecological Momentary Assessment (EMA) derived data, in which parents are asked to assess their parenting stress at different times throughout the day. This could contribute more accuracy because it reduces the risk of over or underreporting instances of parenting stress. Also, child comorbidity disorders and parent psychopathology were not accounted for in this study, which could also increase parenting stress, especially within the difficult child and parent-child dysfunctional interaction subscales. Also, medication was not controlled for in this study.

Conclusions

In conclusion, this study looked at the relationship between ADHD diagnostic status and child-reported emotion regulation and its relationship with parenting stress within three subscales – Parental Distress, Difficult Child, and Parent-Child Dysfunctional interaction. Overall, it was found that ADHD diagnostic status was significantly associated with the Parent Distress subscale, both ADHD diagnostic status and emotion regulation difficulties were significantly associated with the Difficult Child subscale, and emotion regulation difficulties were significantly associated with the Parent-Child Dysfunctional interaction subscale. Not only does this study show that there should be an emphasis on treating parenting stress, but the differences between subscales shows that the type of parenting stress discussed matters when implementing treatment as well. As discussed earlier, parenting stress is associated with parenting practices and child development, more so than any other type of parenting stress (Theule et. al, 2012). The purpose of this study was to shed light on the way ADHD symptoms and emotion regulation difficulties directly affect parents in hopes to generate more research in the area and create more treatment options targeted specifically for this population of parents. This in turn could directly enhance the treatment and care for children with ADHD and emotion regulation difficulties.

References

Abdin, R.R. (1995). *Parenting Stress Index (Third Edition)*. Lutz, FL: Psychological Assessment Resources, Inc.

Aguiar, A., & Eubig, P., & Schantz, S. (2010). Attention Deficit/Hyperactivity Disorder: A Focused Overview for Children's Environmental Health Researchers. *Environmental Health Perspectives.*

Banerjee, T. D., Middleton, F., & Faraone, S. V. (2007). Environmental risk factors for attention-deficit hyperactivity disorder. *Acta Paediatrica*, *96*(9), 1269-1274. doi:10.1111/j.1651-2227.2007.00430.x

Barker, R. A., (1997). Behavioral Inhibition, Sustained Attention, and Executive Functions: Constructing a Unifying Theory of ADHD.

Bode, A. A., George, M. W., Weist, M. D., Stephan, S. H., Lever, N., & Youngstrom, E. A. (2016). The impact of parent empowerment in children's mental health services on parenting stress. *Journal Of Child And Family Studies*, *25*(10), 3044-3055. doi:10.1007/s10826-016-0462-1

Bunford, N., Evans, S. W., & Wymbs, F. (2015). ADHD and emotion dysregulation among children and adolescents. *Clinical Child And Family Psychology Review*,*18*(3), 185-217. doi:10.1007/s10567-015-0187-5

Cracco, E., Van Durme, K., & Braet, C. (2015). Validation of the FEEL-KJ: An instrument to measure emotion regulation strategies in children and adolescents. *Plos ONE*, *10*(9),

Eisenberg, N., Spinrad, T. L., & Eggum, N. D. (2010). Emotion-related self-regulation and its relation to children's maladjustment. *Annual Review of Clinical Psychology*, *6(1)*, 495–525.

Gyurak, A., & Gross, J., & Etkin, A. (2011). Explicit and implicit emotion regulation:A dual-process framework. *Psychology Press.*

Larson, K., Russ, S. A., Kahn, R. S., & Halfon, N. (2007). Patterns of Comorbidity, Functioning, and Service Use for US Children With ADHD. *The American Academy of Pediatrics.* doi:10.1542/peds.2010-0165

MacDermott, S., Gullone, E., Allen, J., King, N., & Tonge, B. (2010). The Emotion Regulation Index for Children and Adolescents (ERICA): A Psychometric Investigation. *Journal of Psychopathology and Behavioral Assessment, 32*, 301-314.

Pliszka, SR. (1998). Comorbidity of attention-deficit/hyperactivity disorder with psychiatric disorder: an overview. *Journal of Clinical Psychiatry.*

Rosen, P. J., Milich, R., & Harris, M. J. (2007). Victims of their own cognitions: Implicit social cognitions, emotional distress, and peer victimization. *Journal Of Applied Developmental Psychology*, *28*(3), 211-226. doi:10.1016/j.appdev.2007.02.001

Rosen, P. J., Milich, R., & Harris, M. J. (2012). Dysregulated negative emotional reactivity as a predictor of chronic peer victimization in childhood. *Aggressive Behavior*, *38*(5), 414-427. doi:10.1002/ab.21434

Seymour, K. E., Chronis-Tuscano, A., Iwamoto, D. K., Kurdziel, G., & MacPherson, L. (2014). Emotion regulation mediates the association between ADHD and depressive symptoms in a community sample of youth. *Journal Of Abnormal Child Psychology*, *42*(4), 611-621. doi:10.1007/s10802-013-9799-8

Shaw, P. & Stringaris, A., & Nigg, J., & Leibenluft, E. (2014). Emotion Dysregulation in Attention Deficit Hyperactivity Disorder. *American Journal of Psychiatry.*

Theule, J., & Wiener, J., & Tannock R., & Jenkins, J. (2012). Parenting Stress in Families of Children With ADHD: A Meta-Analysis. *Journal of Emotional and Behavioral Disorders.*

Theule, J., & Wiener, J., & Rogers, M. (2011). Predicting Parenting Stress in Families of Children with ADHD: Parent and Contextual Factors. *Journal of Child and Family Studies.*

Walerius, D. & Fogleman, N., & Rosen, P. (2016). The Role of ADHD and Negative Emotional Lability in Predicting Changes in Parenting Daily Hassles. *Journal of Child and Family Studies.*

Williford, A. P., Calkins, S. D., & Keane, S. P. (2007). Predicting change in parenting stress across early childhood: Child and maternal factors. *Journal Of Abnormal Child Psychology*,*35*(2), 251-263. doi:10.1007/s10802-006-9082-3

Table 1. *Demographic and Racial/Ethnic Distribution for ADHD and Non-ADHD Diagnostic Groups.*

	ADHD	*Non-ADHD*
Mean Age	8.99±1.39	9.66±1.48
Sex (M)	65.0%	57.5%
Race/Ethnicity		
Caucasian/White	76	53
African-American/Black	29	18
Latino/Hispanic	7	1
Biracial	8	6
Other	0	2

Note: ADHD *N* =120; Non-ADHD *N* =80

Table 2. *Summary of bivariate correlations for ADHD diagnostic status, parent-report PSI, and child-report of ERICA.*

Measure	*ADHD*	*PSI-PD*	*PSI-DC*	*PSI-I*	*ERICA*
ADHD		.22**	.37**	.14*	.16*
ERICA-total		0.07	.17*	.21**	

Note. PSI= parenting stress index; PSI-PD; *p<.05, **p<.01.

ERICA= Emotion Regulation Index for Children and Adolescents

Table 3. *Summary of hierarchical regression: Relation* ***of child-report emotion regulation and ADHD diagnostic status to parent-report of PSI-parent distress***

Step/Variable	R^2	ΔR^2	*F*	*B*	*SE B*	*t*	*β*
Step 1	0.05	0.05	2.79*				
Gender (Female = 0, Male = 1)				3.6	1.46	2.47*	0.19
Age				0.14	0.47	0.3	0.02
SES				-1.54	0.95	-1.63	-.13
Step 2	0.11	0.05	3.60*				
ADHD (Non-ADHD=0, ADHD = 1)				4.29	1.48	2.89**	0.23
ERICA				0.06	0.08	0.76	0.06
Step 3	0.11	0.002	3.06**				
ADHD x ERICA				0.11	0.17	0.65	0.06

Note. PSI = Parenting Stress Index – PSI;PD *p<.05; **p<.01

SES = Socioeconomic Status

ERICA = Emotion Regulation Index for Children and Adolescents

Table 4. *Summary of hierarchical regression:* ***Relation of child-report emotion regulation and ADHD diagnostic status to parent-report of PSI-difficult child***

Step/Variable	R^2	ΔR^2	*F*	*B*	*SE*	*t*	*β*
Step 1	0.001	0.001	0.03				
Gender (Female = 0, Male =1)				0.43	2.31	0.19	0.02
Age				0.15	0.75	0.2	0.02
SES				0.15	1.49	0.02	0.01
Step 2	0.19	0.19	6.88**				
ADHD (Non-ADHD=0, ADHD =				11.38	2.16	5.23**	0.4
ERICA				0.27	0.12	2.18*	0.17
Step 3	0.19	0.006	5.92**				
ADHD x ERICA				0.26	0.25	1.04	0.1

Note. PSI = Parenting Stress Index – PSI;PD *p<.05; **p<.01

SES = Socioeconomic Status

ERICA = Emotion Regulation Index for Children and Adolescents

Table 5. *Summary of hierarchical regression:* ***Relation of child-report emotion regulation and ADHD diagnostic status to parent-report of PSI-parent child difficult interaction.***

Step/Variable	R^2	ΔR^2	*F*	*B*	*SE B*	*t*	β
Step 1	0.03	0.03	1.83				
Gender (Female = 0, Male =1)				-1.91	1.23	-1.55	-.12
Age				-.41	0.4	-1.03	-.08
SES				-1.16	0.8	-1.45	-.11
Step 2	0.08	0.04	2.63*				
ADHD (Non-ADHD=0, ADHD =				1.93	1.25	1.54	0.12
ERICA				0.15	0.07	2.16*	0.18
Step 3	0.08	0.002	2.24*				
ADHD x ERICA				0.09	0.15	0.6	0.06

Note. PSI = Parenting Stress Index
PSI;PD *p<.05; **p<.01

SES = Socioeconomic Status

ERICA = Emotion Regulation Index for Children and Adolescents